AMENDMENTS TO THE DRAWINGS

Replacement sheets are being provided for Figs. 3 and 8. In Fig. 3, the second occurrence of reference numeral "20" is replaced by "21". In Fig. 8, "BURSH" is changed to --BRUSH--.

Attachment: Replacement Sheets - Figs. 3 and 8.

REMARKS

Claims 1-9 are all the claims pending in the application. Claims 10-12 are added via the present Amendment.

35 U.S.C. § 112:

Claims 7-9 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for not providing antecedent basis for the recitation of "said brush abrasion limit portion". Applicants hereby amend claims 7-9 to address the issue noted by the Examiner, such that the rejection thereof should be withdrawn.

35 U.S.C. § 103:

Claims 1,4 and 7

Claims 1,4 and 7 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Purdy et al. (U.S. Patent 4,316,186 [hereinafter "Purdy"]) in view of Maddox (U.S. Patent 4,528,556).

Purdy is cited for allegedly disclosing the features of claim 1, except for a current detection circuit. The Examiner cites Maddox for disclosing a current detection circuit. Without conceding to the Examiner's application of Purdy and Maddox, it is respectfully submitted that the applied references fail to teach or suggest the features of claim 1.

Claim 1 is drawn to a novel and unobvious brush abrasion detector including features neither taught nor suggested by the applied art. In particular, claim 1 describes a brush that is located being slidably press-fitted to a slip ring to create a contact resistance. Claim 1 also describes a current detection circuit for detecting a current value flowing through the field winding of the generator via the brush. The current value is recited as corresponding to the

contact resistance. Similarly, claim 1 recites an output voltage detecting detection circuit for detecting an output voltage value from the generator, where the output voltage corresponds to the contact resistance.

As described in an exemplary embodiment of the present invention, a contact resistance between the brush and slip ring affects a current value or an output voltage value and corresponds to brush wear. Therefore, the invention provides a device that may determine brush wear based on the detected current value or output voltage.

Purdy does not disclose the features of claim 1. Instead, Purdy discloses a brush 10 that utilizes a detecting wire 20, as shown in Figs. 1-4. When the brush 10 wears to the detecting wire 20, the wire 20 contacts a surface of a rotor 50, so as to obtain a positive voltage causing a current to flow through a resistor R104 (see Fig. 5) into a base of a transistor Q102, such that an LED 101 provides a visual indication that the brush has reached an end of its useful life. (See col. 7, lines 10-22 of Purdy.)

Accordingly, Purdy does not utilize a contact resistance between the brush and slip ring to provide a current value or voltage value for determining brush wear. Instead, Purdy requires additional machining of the brush 10 to prepare a hole for containing the detecting wire. Such a configuration raises costs by necessitating additional parts and labor. Maddox also fails to teach or suggest the features of claim 1.

Accordingly, Applicants respectfully submit that the combination of Purdy and Maddox fails to teach or suggest each feature found in claim 1, such that the rejection thereof under 35

U.S.C. § 103(a) should be withdrawn. The rejection of claims 4 and 7 should likewise be withdrawn at least by virtue of their respective dependencies upon claim 1.

Claims 3, 6 and 9

Claims 3, 6 and 9 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Purdy in view of O'Callaghan (U.S. Patent 3,728,565).

Purdy is applied for allegedly teaching the features of claim 3, while the Examiner acknowledges that this reference does not teach or suggest a revolution speed detection circuit and a brush abrasion determination circuit for determining the abrasion state of the brush based on the number of revolutions detected by the revolution speed detection circuit. The Examiner attempts to rely on O'Callaghan for disclosing this feature.

Claim 3 provides a novel and unobvious brush abrasion detector including features that are neither taught nor suggested by the applied art. First, Applicants respectfully submit that O'Callaghan does not teach a brush abrasion determining circuit that determines an abrasion state of the brush based on a number of revolutions. Although the Examiner cites col. 1, lines 10-25, along with col. 2, line 15 - col. 3, line 20, for allegedly disclosing a brush abrasion determining circuit, such a feature is not disclosed. Instead, O'Callaghan is drawn to a device for sensing a rotational direction and shaft speed of a two-phase AC generator. The mere disclosure of detecting a rotational direction does not teach or suggest the features of claim 3 regarding the brush abrasion determining circuit. O'Callaghan does not even discuss brush abrasion. The Examiner is respectfully requested to closely study O'Callaghan and reconsider the rejection. If

the Examiner disagrees for any reason, the Examiner is specifically requested to point out where support is found in O'Callaghan, along with a clear explanation of the relied upon features.

Accordingly, Applicants respectfully submit that the combination of Purdy and O'Callaghan fail to teach or suggest each feature found in claim 3, such that the rejection thereof under 35 U.S.C. §103(a) should be withdrawn. The rejection of claims 6 and 9 should likewise be withdrawn at least by virtue of their respective dependencies upon claim 3.

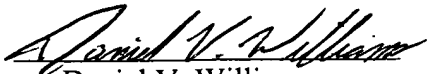
New Claims:

Applicants adds new claims 10-12 to obtain more varied protection for the invention. Claims 10-12 correspond to allowable claims 2-8 and are therefore in condition for allowance.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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